

신진-03

Efficient Prediction of *Hibiscus cannabinus* Biomass through RGB Growth Index Measured by Drone

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[Introduction]

Kenaf (*Hibiscus cannabinus*) is an important industrial crop cultivated worldwide. Moreover, the plant is applied in various fields, including paper and pulp, fabrics, textiles, animal bedding, medicinal, musical instrument, and food crop. As drones in agriculture become common, there is an increasing demand for predicting biomass yields through efficient methods. Not only can individual plant areas be obtained by aerial photography using RGB cameras, but also growth index values such as EXG, EXGR, EXR, GLI, NDI, and VARI can be confirmed. This study predicts the biomass more efficiently by revealing the correlation between plant traits and growth indices by the drone that affects the actual biomass.

[Materials and Methods]

The 14 kenaf cultivars were grown from June 22th, 2020, to August 31st, 2020, in a Jeju national university test field, Korea (33°27'35.7"N 126°33'50.3" E DMS). The number of nodes, stem diameters of three randomly selected kenaf individuals from each section was measured at three sets June 22th, 2020, July 14th, 2019, and August 31st, 2020. An RGB camera was used to take pictures of kenaf fields by drone. Using the kenaf field pictures, separate plant area and growth index values of EXR, EXGR, EXG, GLI, NDI, and VARI were obtained. Data analysis was performed with R (Ver. 1.3.1056., RStudio Team, R Foundation for Statistical Computing, Boston).

[Results and Discussion]

It was confirmed that the growth indices had a significant correlation with the actual growth. NDI showed the highest positive correlation with surface area and stem diameter in Set4, the latest growth stage. In contrast, the number of nodes did not appear to correlate with all growth indices. The plant surface area and NDI can be measured through aerial photography using a drone, and the total biomass can be predicted more easily than the previous direct sampling method by predicting the height and stem diameter of the field kenaf through NDI.

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